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Nutritional Status of Children and Maternal Knowledge, Attitudes, and Practices of Conditional Cash Transfer (CCT) Beneficiaries and Non-Beneficiaries in Lucena City, Quezon, Philippines

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Abstract. The study evaluated the impact of Philippine CCT adopted as *Pantawid Pamilyang Pilipino Program* (4Ps) on health key outcomes focused on maternal knowledge, attitudes, and practices and maternal and child's (6 mos. to 5 y/o) nutritional status. Data from 91 respondents in each group of 4Ps and non beneficiaries showed that 4Ps had significantly higher maternal education. In knowledge score, non beneficiaries were 3.3% significantly lower than the 4Ps average score of 73.1%. Main source of information was health center lectures. In attitude items, both groups had positive perceptions on health and nutrition. The 4Ps mothers/guardians had better practices on maternal and child care. Nutritional status of non beneficiary children had higher prevalence of underweight (24.2%), stunting (47.3%), wasting (8.8%), and overweight (5.5%). The same applies to non beneficiary mothers/guardians, having higher prevalence of CED (17.6%), overweight (23.1%), and obesity (7.7%). Findings showed that the program is successful in investing in human capital through good health. However, malnutrition prevalence is still considerably high.

Keywords: maternal knowledge, health, nutrition, 4Ps.

1. Introduction

Poverty has remained one of the most consequential problems in the Philippines as observed in the past decade where there is little reduction despite continuous economic growth. To help meet short-term consumption needs while fostering investment in human capital and break the intergenerational transmission of poverty, the country launched a Conditional Cash Transfer (CCT) program in 2008 which was adopted as *Pantawid Pamilyang Pilipino Program* (4Ps) [1], [2]. Part of the conditionalities entitled to grantees is to attend the monthly Family Development Session (FDS) that includes topics on family formation and parenting practices [3]; and to comply with monthly preventive health check-ups for pregnant women and children aged 0-5 years old, in which corresponding health and nutrition lectures are discussed [4]. These two health commitments are assumed to increase health service utilization and significantly contribute in imparting knowledge to mothers, which could influence attitudes and practices.

Since the program's launched in 2008, impact evaluations have found areas of improvements deemed necessary to consider in expanding the implementation. Given this, further evaluation in different aspects of its outcome is helpful in making changes necessary along the way for continuous assessment and planning [5]. This study evaluated the program's impact on health outcomes as part of its objectives which includes maternal knowledge, attitudes, and practices (KAP) and nutritional status of mothers and children.

2. Materials and Methods

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2.1. Data Collection

An evaluation design using quasi-experimental method was used by comparing outcomes among eligible 4Ps beneficiaries and non beneficiaries (identified official potential grantees) assuming same baseline characteristics. The study had two sample domains having proportionate sample size of 91 in each group, representing complete enumeration for non beneficiaries while simple random sampling for 4Ps. Data collection was conducted in Lucena City through scheduled interview with mothers/guardians using structured questionnaire, while anthropometric measurements were primarily obtained from both mothers/guardians and their children following the WHO standardized procedures. Questionnaire items in KAP were sourced out from FDS and health center lectures from the Department of Health protocols. All the items had been developed and tested for validity and reliability in a preliminary study of the researchers.

2.2. Data Analyses

Data entry was performed with Microsoft Excel for the questionnaire while OPT+ Tool for nutritional status of children. Statistical analyses were done using SPSS (Ver. 20). Phi Cramer's V was used in determining the association of being a beneficiary or not with that of respondents' characteristics and nutritional status (ordinal data). Meanwhile, one-sample t-test was used in determining significant difference of some specific practices (ratio data) between 4Ps and non beneficiaries. Spearman rank order correlation was used in determining the relationship of knowledge items with corresponding related practices and attitudes.

3. Results

3.1. Characteristics of the Sample

The mothers/guardians in 4Ps were younger than non beneficiaries having lower average age (34 vs. 51y) and range (18-67 vs. 23-78 y). This supports the observation that majority of 4Ps respondents were mothers (94.5%) while grandmothers (53.8%) in non beneficiaries. Consequently, 4Ps respondents were also the ones who accompany the child in monthly health check-ups and attend FDS seminar. In maternal education, 4Ps has significantly higher educational attainment than non beneficiaries where majority were high school graduate (40.7%), while elementary graduate and below (50.6%) for the latter (ρ=0.026). On the other hand, employment status was higher among non beneficiaries (38.5%) than 4Ps (24.2%) where majority of both groups were vendors, house helpers, and in laundry service.

Age among children was considered in analyzing variables that applies only to specific age groups. Children in 4Ps were older than non beneficiaries having higher average age (52 vs. 33 mos.) and lower range (11-65 vs. 6-62 mos.).

3.2. Knowledge

Maternal knowledge was determined through health, nutrition, and supplement intake for pregnant and lactating women and children. The percentage of 4Ps and non beneficiary respondents who answered correctly in each item were shown in Fig. 1 to Fig. 5.

3.2.1. Health

Fig. 1 shows that 4Ps has higher percentage than non beneficiaries in the following items: (Q1) have at least 4 pre-natal check-ups with an average answer of 7.3 times; (Q3) have tetanus toxoid immunization during pregnancy; (Q4) have family planning consultation at post-natal visit; and (Q5) know the recommended pregnancy gap (3-5 y) with an average answer of 3 years. On the other hand, more non beneficiaries were aware on (Q2) when to have post-natal check-up.

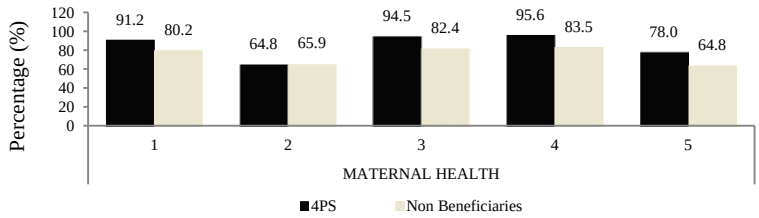

Fig. 1: Percentage distribution of 4Ps and non beneficiary mothers/guardians with correct answers in maternal health.

In child health items, Fig. 2 shows that 4Ps has higher percentage than non beneficiaries in the following items: (Q6) frequency of deworming per year (2 times) with an average answer of 1.7 times in both groups, ranging from 0-4 times; and (Q9) diarrhea is having three watery stools in a day. Meanwhile, more non beneficiaries were aware that (Q8) infant must undergo Newborn screening after birth. On the other hand, both groups had the same percentage aware of the (Q7) necessity to complete the recommended immunization within the first year of the infant and of the (Q10) recommended treatment measures in diarrhea.

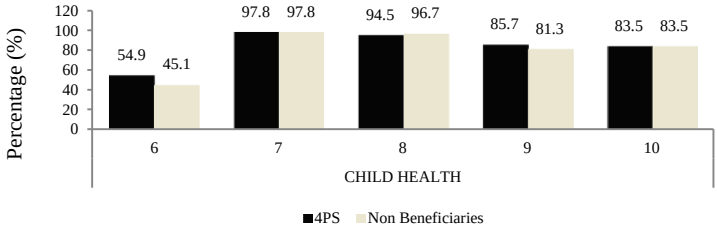

Fig. 2: Percentage distribution of 4Ps and non beneficiary mothers/guardians respondents with correct answers in child health items.

3.2.2. Nutrition

In pregnancy nutrition, Fig. 3 shows that 4Ps has higher percentage than non beneficiaries in the following items: (Q1) leafy vegetables that are high in fiber are good for pregnant women; (Q2) anchovy and dark green leafy vegetables that are high in Calcium are good for the bones; it is recommended to (Q4) drink ≥ 8 glasses of water a day and to (Q5) have additional foods during pregnancy and lactation. Meanwhile, more non beneficiaries were aware that (Q3) insufficient iron intake could lead to anemia and (Q6) foods with *Sangkap Pinoy Seal* (SPS)—fortified foods, have additional nutrient/s.

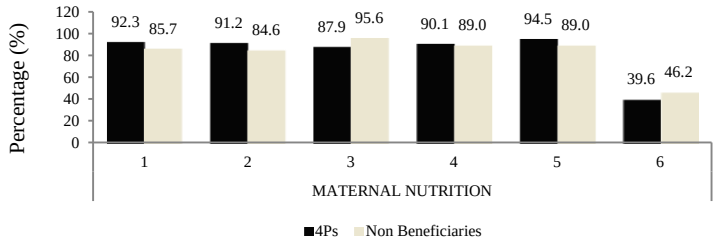

Fig. 3: Percentage distribution of 4Ps and non beneficiary mothers/guardians with correct answers in maternal nutrition items.

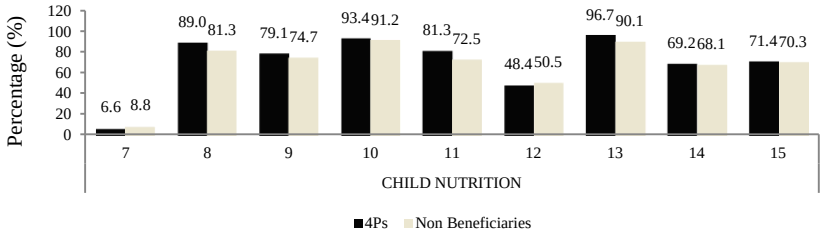

Fig. 4: Percentage distribution of 4Ps and non beneficiary mothers/guardians with correct answers in child nutrition items.

In child nutrition, Fig. 4 shows that 4Ps has higher percentage than non beneficiaries in the following recommendations: (Q8) initiating breastfeeding within the first hour after birth; (Q9) drinking colostrum (yellowish and viscous breastmilk) is good for infant; (Q10) giving solid foods starting 6th month of the infant while continuously breastfeeding; (Q11) breastfeeding more frequently when infant is sick; (Q13) drinking milk is still appropriate for children ≥ 2 years old; (Q14) giving high fat foods should not be limited to children and (Q15) using iodized salt is good for child's growth and development. Meanwhile, there were more non beneficiaries, ranging from 8.8 to 50.5%, who agreed that (Q7) water and other fluids should not be given together with breastmilk in the first 6 months; and (Q12) a sick mother is recommended to still breastfeed.

3.2.3. Supplement intake

Fig. 5 shows that there were more 4Ps respondents who agreed to all the recommended supplement intake given as: (Q1) when to take iron-folate tablets, in which during pregnancy (75.8%) is higher than during 3 months postpartum (9.4%); (Q2) frequency of annual vitamin A supplementation (2 times) among under-five children having lower range in non beneficiaries than 4Ps (0-5 vs. 0-12 times); (Q3) vitamin A supplement is only for under-five children; (Q4) and underweight babies need iron supplement.

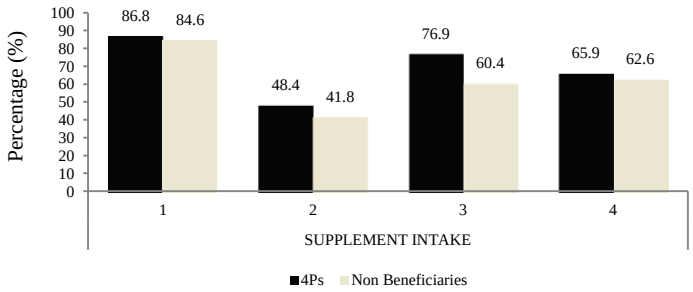

Fig. 5: Percentage distribution of 4Ps and non beneficiary mothers/guardians with correct answers in supplement intake items.

In summary, knowledge percentage score of 4Ps (73.1 ± 9%) is higher than non beneficiaries (69.7 ± 9.8%) in which more 4Ps respondents answered correctly in 21 out of 29 questions. Specifically, knowledge score of non beneficiaries is significantly lower by 3.3% than 4Ps group (ρ=0.002). This could be accounted to the conditionality among 4Ps to attend health and nutrition lectures from FDS and health center check-ups. This causality is supported by studies demonstrating significant positive effect of outside maternal school learning in the reduction of child malnutrition [6]-[8].

3.2.4. Source of information

Major sources of health and nutrition knowledge were determined as shown in Fig. 6. Among all the questions, suggestion from health experts had the highest percentage, followed by suggestion from non-health experts; self-opinion; seminar; and lastly is media. In 4Ps group, attending FDS lecture on health and nutrition is not significantly associated with knowledge scores (ρ=0.067). Furthermore, only 2.5% in 4Ps answered seminar which could be explained that health experts facilitating the health and nutrition FDS lectures could had possibly been categorized in the 2nd option (suggestion of health experts) instead of seminar per se. At 1% significance level, self-opinion was found to have negative moderate correlation (r_s=.370, ρ=0.048). This shows that as self-opinion increases, knowledge scores decreases. Its implications show the necessity of knowledge inputs to the respondents from reliable sources.

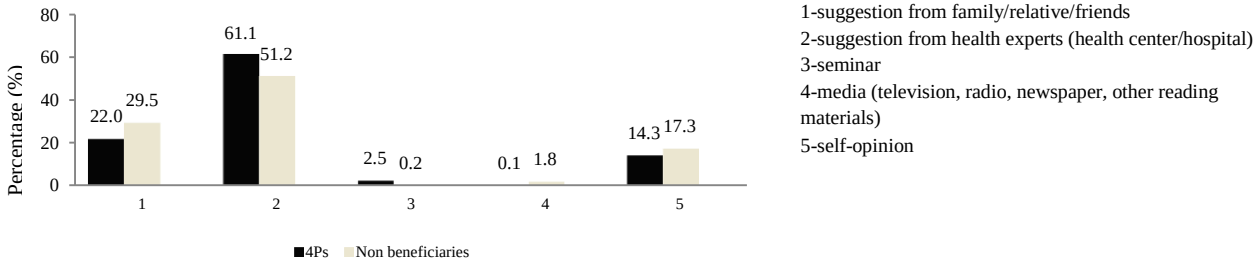

Fig. 6: Percentage distribution of sources of information of 4Ps and non beneficiary mothers/guardians for knowledge items.

3.3. Attitudes

Being in the position that shows someone's tendency to do something defines attitude which helps explains why some practices are preferred over others [9]. Fig. 7 shows that 4Ps has higher proportion of respondents with the following perceptions: (Q2) believes in folk sayings on pregnancy and child feeding; (Q4) family members have same needed nutrients; (Q6) visits health center *not* only when a child or pregnant woman is sick; (Q7) has willingness to follow family planning; (Q8) believes that family has

adequate daily food intake; and (Q10) has enough knowledge for the family to have proper nutrition and good health. On the other hand, non beneficiaries were higher in the following: (Q1) has willingness to breastfeed child up to 2 years; (Q3) children and pregnant women need supplements; (Q5) not having illness is *not* enough to conclude that a person is healthy; and (Q9) worries about their family's nutritional status and health.

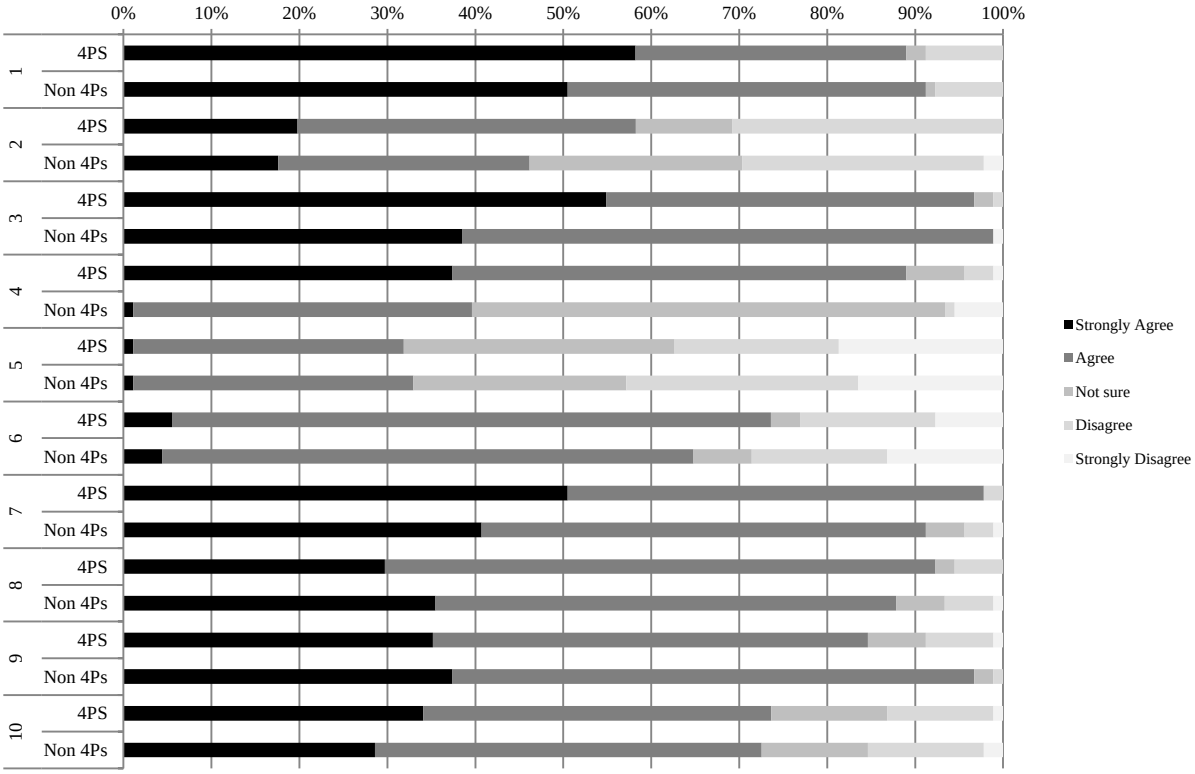

Fig. 7: Percentage distribution of perception level in attitude items of 4Ps and non beneficiary mothers/guardians.

3.4. Practices

3.4.1. Mother

Fig. 8 shows that 4Ps has higher percentage who did the following practices during pregnancy period; (Q1) had ≥ 4 times pre-natal check-ups with an average of 7.4 times in both groups; (Q2) had tetanus toxoid immunization; (Q3) took necessary supplements in which both groups consumed mostly ferrous sulfate (63.2%), vitamins (24.7%), milk for pregnant women (10.4%), while others do not know the label (2.2%), respectively; (Q4) had more food intake; had daily intake of (Q5) ≥ 8 glasses of water, (Q6) ≥ 4 servings of fish or meat, and (Q7) about 1 cup of vegetables. Meanwhile, more non beneficiaries (Q8) had daily fruit intake.

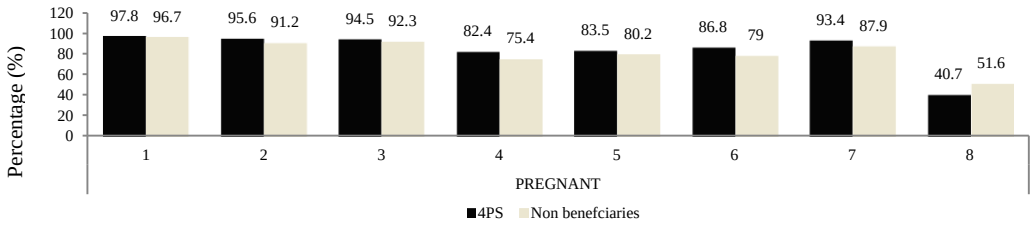

Fig. 8: Percentage distribution of positive health and nutrition practices of 4Ps and non beneficiary mothers during pregnancy.

3.4.2. Child

Fig. 9 shows that there were more 4Ps mothers/guardians who do the following child practices; (Q10) deworm yearly; (Q12) breastfed the child with an average of 16.5 against 13.5 months in non beneficiaries; (Q15.3) give coffee and (Q15.4) junk food; and (Q18) give more foods and water when the child is sick. Meanwhile, more non beneficiaries do the following practices: (Q9) Newborn Screening; (Q11) exclusive

breastfeeding for the first 6 months; (Q14) give snacks twice a day; (Q15.1) give milk and (Q15.2) soft drinks; give daily intake of (Q16) about 1/3 cup of vegetables* and (Q17) about 3 tablespoons of fish or meat*; and (Q19) provide own eating utensils to the child. On the other hand, both groups had same respondent proportion that (Q13) give solid foods starting 6th month of the child.

In general, practices of 4Ps show higher compliance than non beneficiaries in maternal and child health services and supplement intake which could be due to their health commitments.

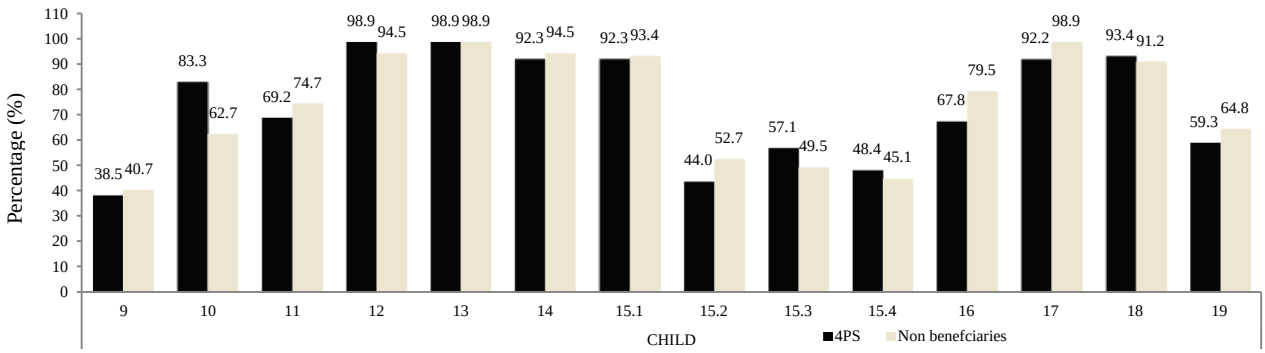

Fig. 9: Percentage distribution of positive health and nutrition practices on 4Ps and non beneficiary children.

3.5. Relationship of Knowledge, Attitudes, and Practices Items

Only 5 out of 16 knowledge items with corresponding related practices and/or attitude have significant correlation. At 5% significance level, awareness on the beneficial effect of fiber intake in pregnant women is weakly correlated with eating one cup of vegetables a day; secondly, awareness on when to take iron-folate tablets is moderately correlated with the perception that women and children need supplements. Meanwhile, at 1% significance level, awareness on SPS is moderately correlated with consumption of SPS-foods; secondly, initiation of complementary feeding at 6th month is moderately correlated with timely introduction of solid foods; and lastly, awareness on the benefits of iodized salt in child's growth is moderately correlated with its household use. Since all correlations have positive relationship, then as the awareness on a particular topic increases, the corresponding related practice or attitude also increases.

3.6. Nutritional Status

Given that nutritional status is one of the health key outcome indicators of 4Ps program, anthropometric measurements among children were interpreted using WHO-Child Growth Standards weight-for-age, height-for-age and weight-for-height indicators. Meanwhile, BMI using International cut-off was used among mothers/guardians.

3.6.1. Child

Among the malnutrition indicators, on the average, stunting has the highest prevalence, followed by underweight, wasting, and overweight, respectively (Fig. 10). However, only wasting (weight-for-height) has significant difference between 4Ps and non beneficiaries groups (ρ=0.045). In addition, the prevalence of undernutrition is higher while lower in overnutrition when compared to the national figures as of 2013 among under-five children. This could be explained by the socio-economic characteristic of this study's target population, who are households within the low wealth index quintile.

For the comparison of two groups, non beneficiary children were higher than 4Ps by 2.2% in underweight, 8.8% in stunting, 5.5% in wasting and overweight. These differences could be accounted to the higher educational attainment and knowledge scores of 4Ps mothers/guardians. This causality has been well demonstrated by a number of literature showing significant decrease in child malnutrition as the level of maternal education increases, which might have lead to better child care including feeding practices [8], [10]-[12]. In addition, higher health service utilization among 4Ps and significantly longer breastfeeding period might have also imparted positive effect on nutritional status. Many studies have shown the protective effect of breastfeeding in malnutrition which is strongest in the first year [13].

*applicable only to 1-5 year-old children

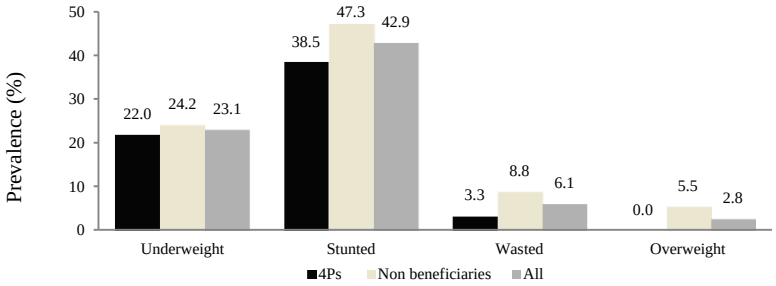

Fig. 10: Prevalence of malnutrition among 6 month- to 5 year-old 4Ps and non beneficiary children based on WHO-CGS classification.

3.6.2. Mother

Among the malnutrition indicators, overweight has the highest prevalence, followed by Chronic Energy Deficient (CED), and obesity, respectively (Fig. 11). However, there was no significant association between BMI and being a 4Ps beneficiary or not (ρ=0.198). When compared with the national figures as of 2013, prevalence of CED was higher while lower in overweight/obesity. This could be due to the causality that as wealth index decreases, CED prevalence increases, while overweight/obesity decreases [14]. Moreover, non beneficiary mothers/guardians were higher than 4Ps by 8.8% in CED, 4.4% in overweight, and 1.1% in obesity. These differences could be due to the significantly higher maternal education of 4Ps than its counterpart. Studies showed that as level of education increases, the prevalence of obesity decreases regardless of sex [15].

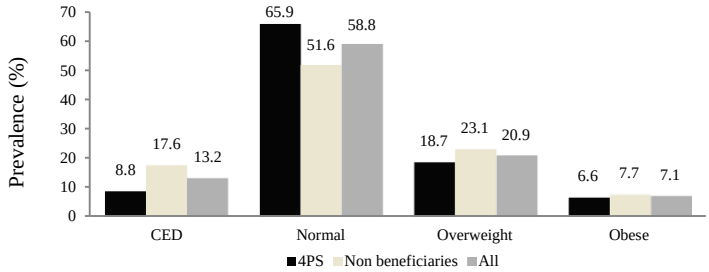

Fig. 11: Nutritional status of 4Ps and non beneficiary mothers/guardians based on BMI classification.

Furthermore, at 1% significance level, BMI of non beneficiaries has weak positive correlation with weight-for-age (r_s=0.231, ρ=0.028) and weight-for-height (r_s=0.236, ρ=0.024) which are both indicators of under- and overweight. This shows that as the BMI of mothers/guardians increase (overweight) or decrease (underweight), so as their child's weight-for-age and weight-for-height. This translates to having the same form of malnutrition across different age groups within the household which may imply equal allocation of resources to the target groups.

4. Conclusion

The Philippine 4Ps program is successful in meeting one of its objectives—investing in human capital through good health. Through the program's cash grant and health care commitments, maternal knowledge and nutritional status of 4Ps mothers/guardians and their children were better than non beneficiaries. However, severity of malnutrition prevalence among children is still high. This might be due to the need to further improve health and nutrition knowledge among mothers/guardians through more effective approaches in Family Development Session and other knowledge sources.

5. Recommendations

To address all possible contributing factors of malnutrition, it is recommended to strengthen coordination and participation with health centers for optimum effectiveness of health and nutrition education. The essential maternal and child care knowledge should have heightened emphasis so as for mothers to have deeper understanding of its necessity and its untoward consequences of non compliance. Some concerns that call greater attention in which around 15 to 90% of 4Ps respondents were not aware of are: importance of colostrum for the newborn; exclusive breastfeeding; treatment measures in diarrhea; necessity of supplement intake for pregnant and lactating women; and awareness on SPS.

Communication approach in FDS could be further improved through having stronger knowledge reinforcement such as review of previous lecture highlights or provision of periodic assessment of new learning. Another area of improvement is the conditionality that the grantee must be the FDS attendee though many of them are senior citizens as shown in this study. To maximize the potential of knowledge improvement, FDS attendees should be in a good position to keep focused attention and have willingness to learn. Hence, policies in FDS compliance could consider attendees' age, educational attainment, position and role in the family.

6. Acknowledgement

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7. References

[1] N. Chaudhury and Y. Okamura. Conditional Cash Transfers and School Enrollment: Impact of the Conditional Cash Transfer program in the Philippines. *The World Bank Group*. 2012. Philippine Social Protection Note No. 6.

[2] R. Velarde and L. Fernandez. Welfare and distributional impact of the Pantawid Pamilyang Plipino Program. *The World Bank Group*. 2011. Philippine Social Protection Note No. 3.

[3] 4Ps Social Marketing Unit. Pantawid Pamilyang Pilipino Program. *FAQs on the CSO Engagement in FDS and FDS Plus.* [Online] July 12, 2012. [Cited: June 3, 2014.] http://pantawid.dswd.gov.ph/index.php/pantawid-pamilya-cso-faq.

[4] Department of Social Welfare and Development (DSWD). Conditional Cash Transfer (CCT) Philippines-Improving the human capital of the poor (Pantawid Pamiliyang Pilipino Program). 2009. 4Ps Concept Paper for MCC.

[5] CM. Reyes, AD. Tabuga, C. Mina and R. Asis. Promoting inclusive growth through 4Ps. Philippine Institue for Development Studies. Discussion Paper Series No. 2013-09.

[6] P. Enklud, K. Imai and F. Felloni. Women's organizations, maternal knowledge, and social capital to reduce prevalene of stunted chidren: Evidence from rural Nepal. *The Journal of Development Studies*. 2007, Vol. 433, pp. 456-489.

[7] S. Block. Maternal nutriiton knowledge versus schooling as determinants of child micronutrient status. *Oxford Economic Papers*. Vol. 59, pp. 330-353.

[8] R. Semba, S. De Pee, K. Sun, M. Sari, N Akhter and M. Bloem. Effect of prenatal formal education on risk of child stunting in Indonesia and Bangladesh: a cross-sectional study. *The Lancet*. 2013, Vol. 371 (96090), pp. 322-328.

[9] S. Gumucio. The KAP Survey Model. Data Collection: Quantitative Methodes. IGC Communigrpahie. 2011.

[10] W. Girma and T. Genebo. Determinants of nutritional status of women and children in Ethopia. Calverton, Maryland, USA: ORC Macro. 2002.

[11] A. Mukiria, J. Cushing and J. Sangha. Nutritional satus of children: Results from the Demogrpahic and Health Surveys 1994-2001. Calverton, Maryland: ORC Macro. *DHS Comparative Reports.* 2005.

[12] Makoka, D. The Impact of Maternal Education on Child Nutrition: Evidence from Malawi, Tanzania, and Zimbabwe. *Demographic Helath Surveys*. 2013, No. 84.

[13] L. Adair and D. Guilkey. Age-specific determinants of stunting in Filipino children. *The Journal of Nutrition*. 1996, Vol. 127, pp. 314-320.

[14] [14] FNRI-DOST. *Philippine Nutrition Facts and Figures 2011*. Bicutan, Taguig, Metro Maila: FNRI-DOST. 2012.

[15] National Obesity Observatory (NOO). Adult obesity and socioeconomic status. *NOO data fact sheet*. [Online] September 2012.[Cited: July 4, 2014]. http://www.noo.org.uk/uploads/doc/vid_16966_AdultSocioeconSep2012.pdf